UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>12 September 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9-13,18 and 23* is/are allowed.

6)☒ Claim(s) *1-8,14-17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

2.   Claims 19-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows.

3.   Claims 19-23 recite " **A program stored in memory for detecting....** " embodying functional descriptive material However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed " a program stored in memory " (line 1 of claims 19-23) can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The Examiner suggests amending the claim such as "**A computer-readable medium storing a computer program for detecting** ..." or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1-8, 14-17 and 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Bloom et al (U. S. 6,282,300 B1).

Regarding claim 1, Bloom discloses a method of detecting one or more patterns embedded in an image, each pattern having been formed substantially from a one-dimensional basis function, said method comprising the steps of: (a)

calculating a projective transform of said image (column 16, lines 11-21);

(b) calculating a 1-D correlation between the projective transform (column 6, lines 29-36) and said basis function for a selection of angles (column 11, lines 39-42); and,

(c) finding one or more peaks of said correlation (column 2, lines 39-41 and column 12, lines 17-21), wherein the position of each of said peaks provides spatial parameters (column 6, lines 1-8) of one of said one or more embedded patterns (column 8, lines 9-12).

Regarding claim 2, Bloom discloses a method of determining transformations applied to an image, said image having at least three patterns embedded therein, each pattern having been formed substantially from a one-dimensional basis function being substantially scale invariant as herein defined, said method comprising the steps of:

(a) calculating a projective transform of said image (column 16, lines 11-21);

(b) calculating a 1-D correlation between the projective transform (column 6, lines 29-36) and said basis function for a selection of angles (column 11, lines 39-42);

(c) finding peaks of said correlation (column 2, lines 39-41 and column 12, lines 17-21), wherein the positions of said peaks provide spatial parameters of said embedded patterns (column 8, lines 9-12); and,

(d) determining from said spatial parameters said transformations (column 15, lines 59-63).

Regarding claim 3, Bloom discloses a method as claimed in claim 1, wherein

step (a) comprises the sub-steps of: (a1) transforming said image to the frequency

domain using a two-dimensional transform (column 16, lines 13-21); (a2) resampling the

transformed image onto a quasi-polar map (column 8, lines 37-53); and (a3) inverse

transforming the resampled image to the space domain using a one-dimensional

transform (column 4, lines 20-26 and column 8, lines 43-47).

Regarding claim 4, Bloom discloses a method as claimed in claim 1, wherein

step (b) comprises the sub-steps of: (b1) transforming said projective transform to the

frequency domain using a one-dimensional transform (column 4, lines 8-15); (b2)

transforming said basis function to the frequency domain using a one-dimensional

transform (column 6, lines 29-36); (b3) multiplying the transformed projective transform

with the transformed basis function along radial lines to create a result (column 7, lines

1-10 and column 16, lines 12-19); and (b4) inverse transforming said result to the space

domain using a one-dimensional transform (column 8, lines 43-47).

Regarding claim 5, Bloom discloses a method as claimed in claim 1, wherein

step (b) comprises the sub-steps of: (b1) determining a scale factor (column 5, lines 37-

40); (b2) scaling said basis function with said scale factor to form a scaled basis

function (column 14, lines 61-64); and (b3) cross-correlating said scaled basis function

and said projective transform for a selection of angles (column 11, lines 32-42).

Regarding claim 6, Bloom discloses a method as claimed in claim 5, wherein

step (b1) comprises the sub-steps of: (b1i) calculating a magnitude of the 1-dimensional

Fourier transform of said basis function (column 10, lines 49-57); (b1ii) calculating a

magnitude of the 1-dimensional Fourier transform of said projective transform (column 10, lines 49-57); (b1 iii) resampling said magnitudes onto a logarithmic sampling space (column 8, lines 37-47); (b1iv) correlating the resampled magnitudes of the 1-dimensional Fourier transforms of said basis function and projective transform along constant radial lines (column 7, lines 1-10 and column 16, lines 12-19); and (b1v) finding at least one absolute peak in the result of step (b1iii) (column 12, lines 17-21), wherein the location of said peak is used to determine said scale factor (column 5, lines 37-40).

Regarding claim 7, Bloom discloses a method of detecting one or more patterns embedded in an image, each pattern having been formed substantially from a one-dimensional basis function, said method comprising the steps of: transforming said image to the frequency domain using a two-dimensional transform (column 16, lines 13-21); resampling the transformed image onto a quasi-polar map (column 8, lines 37-53); transforming said basis function to the frequency domain using a one-dimensional transform (column 16, lines 13-19); multiplying the resampled transformed image with the transform of said basis function along radial lines to create a first result; inverse transforming (column 4, lines 20-26) said first result to the space domain using a one-dimensional transform to create a second result (column 7, lines 1-10 and column 16, lines 12-19); and finding one or more peaks of said second result (column 2, lines 39-41 and column 12, lines 17-21), wherein the position of each of said peaks provides spatial parameters (column 6, lines 1-8) of one of said one or more embedded patterns (column 8, lines 9-12).

Claims 8, 14 and 19 are similarly analyzed as claim 1 above.

Claims 15 and 20 are similarly analyzed as claim 2 above.

Claims 16 and 21 are similarly analyzed as claim 7 above.

Claims 17 and 22 are similarly analyzed as claim 8 above.

Allowable Subject Matter

7.   The following is an Examiner's statement of reasons for allowance.

The prior art of record fails to teach or suggest, the function $f(r) = \cos(\alpha \log|r| + c)$ in

combination into other features and elements of **claims 9 and 18 and 23**.

8.   **Claims 9-13, 18 and 23 are allowed.**

Other Prior Art

9.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Chen et al (U. S. 6,233,347 B1) disclose system method, and product for

information embedding using an ensemble of non-intersecting embedding generators.

Deguillaume et al (U. S. 6,904, 151B2) disclose method for the estimation and

recovering of general Affine Transform.

Contact Information

10.   Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is

(571) 272-7458.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Bhavesh Mehta, can be reached at (571) 272-7453. The fax phone number for organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Technology Division 2624

May 5, 2007